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(54) **Firebreak for building overcladding**

(57) A firebreak for a building overcladding system comprises a generally horizontal joint (1) disposed between vertically adjacent cladding panels (7, 7') and a layer of mineral wool (2) filling the space directly between the joint (1) and the wall (3) of the building when the joint (1) is installed.

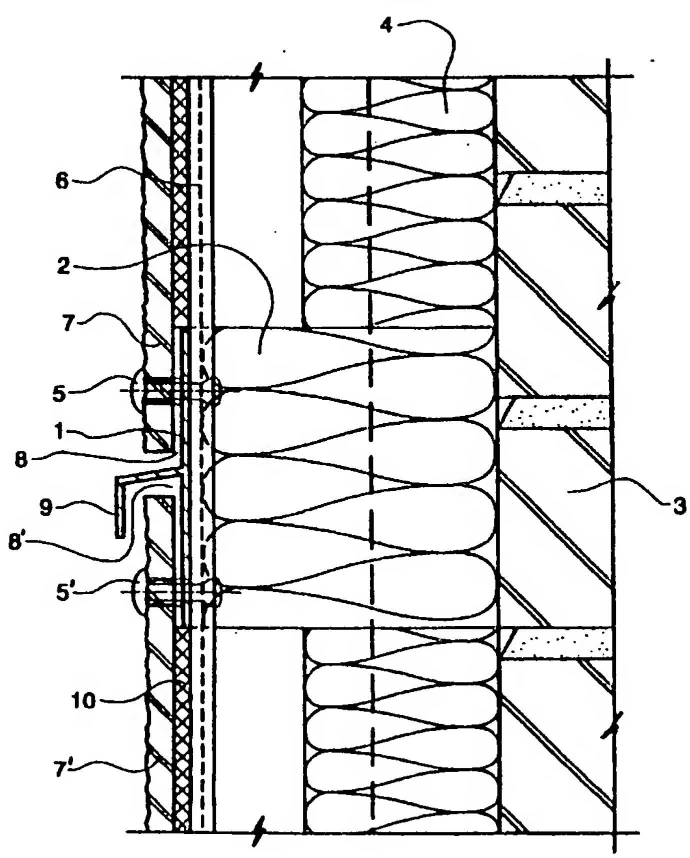

Figure 1

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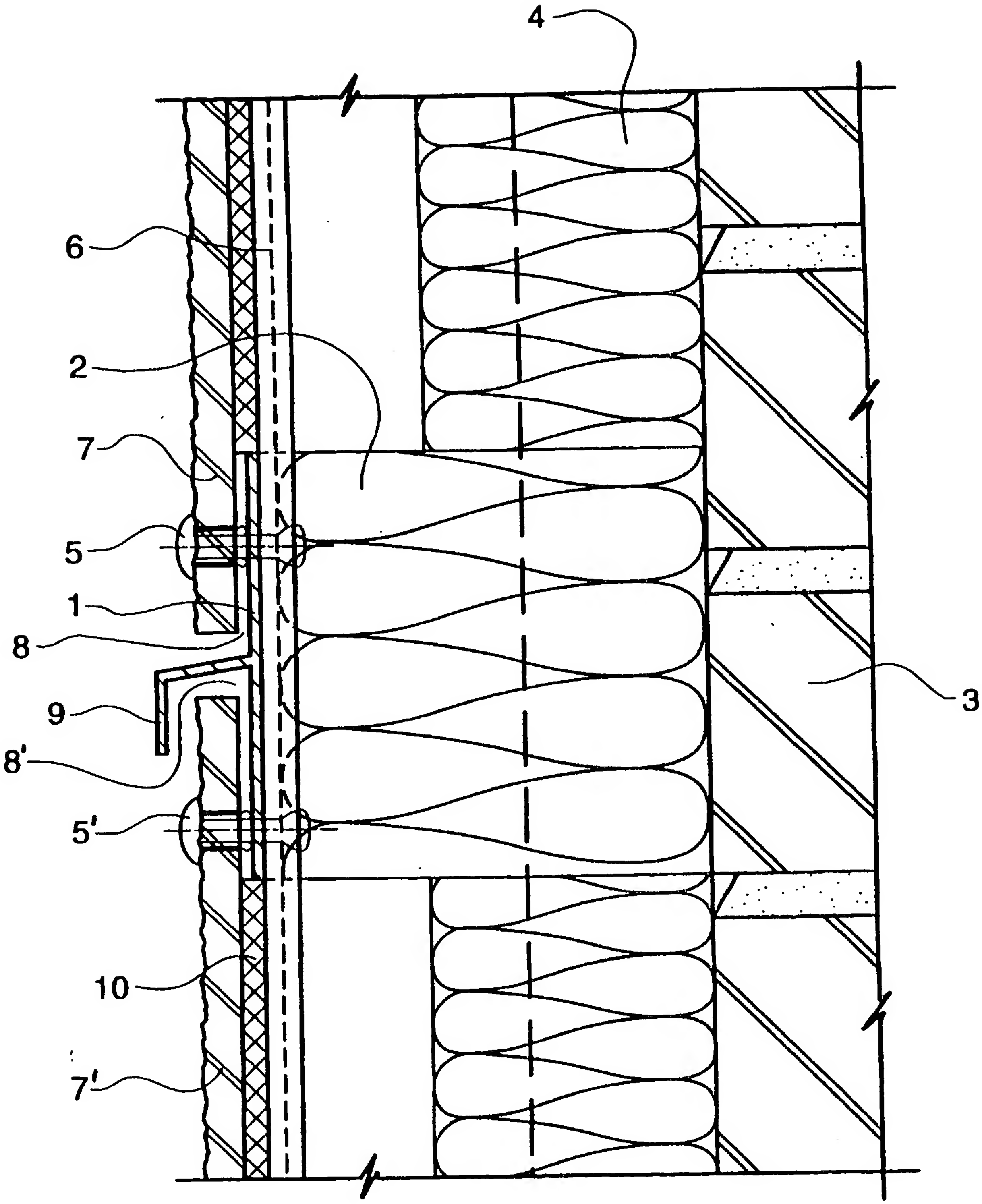

Figure 1

IMPROVED FIREBREAK

This invention relates to the provision of improved firebreaks in building overcladding systems, in particular, but not exclusively, board-type systems.

Since the mid-1970s, it has been known to provide buildings, particularly high- or low-rise tower blocks, with an overcladding of one form or another. The purpose of the overcladding is mainly to protect the fabric of a building from damage and erosion caused by wind, rain and solar radiation, but the overcladding may also serve to provide insulation and to improve the aesthetic appearance of the building.

One method of overcladding is the render system, which is mainly applied in low-rise refurbishments. In the render system, mineral or polystyrene insulation is externally secured to the existing building structure either by way of 'through face' fixings, or by way of a railing system. A render, which will generally be polymer-modified, is then trowelled onto the external face of the insulation in one or more coats in order to achieve a specified thickness. Reinforcing mesh may be incorporated for extra strength, particularly around openings such as window reveals and soffits. With the render system, it is very important to ensure weather proofing around openings including aluminium or uPVC cill sections. If water breaches the render, the effectiveness of the insulation is impaired and damage to the building may result.

A more recent alternative to the render system is the board system. The support structure in the board system comprises aluminium brackets anchored back to the existing structure. These brackets support vertical spanning aluminium 'T'-section rails. Insulation is fixed to the external elevations of the existing structure and flat boards, generally comprising laminated or glass reinforced plastic

panels, are offered up to the 'T' rails and face-fixed using pop rivets. Thermal and moisture expansion and contraction are accommodated by the fixings. Vertical joins between panels are formed via the 'T' rails which create drainage channels. The board system also suffers the disadvantage that water penetration can impair the effectiveness of the insulation and result in damage to the building.

The most versatile and effective, though expensive, overcladding system is the aluminium rainscreen cassette system. This system provides a back-ventilated and drained aluminium cladding envelope designed to achieve internal and external pressure equalisation and to protect external walls from rain wetting and solar radiation. An insulating material, such as mineral wool, is secured to the existing facade. A support structure is then fixed to the building through the insulation material. The support structure is attached by means of a number of brackets bolted onto the building at floor levels by way of steel bolts. Vertically running support mullions are then bolted onto the brackets, and a rainscreen is then built onto the support structure by means of panels which are hooked onto the support mullions. The panels are generally made out of aluminium, and may be polyester powder coated in a variety of colours. This type of installation provides a ventilated cavity behind the rainscreen which helps to reduce condensation, assist the evaporation of ingressed moisture, and which allows the original fabric of the building to breathe. These advantages of the rainscreen cassette system arise from the fact that the panels are disposed on the vertical support mullions in such a way that rain can pass between horizontally adjacent panels, and can then run down to ground level via channels provided in the vertical support mullions.

The horizontal joins between vertically adjacent panels are designed to allow rain through, but to reduce its momentum by means of deflection flanges. Consequently, any rain which penetrates the rainscreen will run down the inside of the ventilated cavity. Since the rainscreen is not an impervious curtain wall, such a breach of the rainscreen does not lead to structural failure, since the ventilation allows the ingressed moisture to evaporate. Furthermore, any condensation build-up behind the rainscreen is also allowed to evaporate.

Because of the expense of the aluminium rainscreen cassette cladding system, the less costly board-type system continues to be commonly installed.

In 1990, a building in the United Kingdom provided with a board-type overcladding caught fire at ground level due to arson, and the overcladding burnt to the top of the building. Subsequent investigations showed that the cavity between the original fabric of the building and the overcladding did not have any fire barriers, and accordingly acted like a chimney flue, thereby promoting the fire. In 1992, U.K. building regulations were amended to stipulate that firebreaks be included in rainscreen cladding systems at every floor.

In a render-type system, there is seldom a cavity between the cladding and the fabric of the building, and accordingly these systems do not generally require firebreaks. In aluminium cassette-type systems, mineral wool may be compressed throughout the cavity between the panel and the wall of the building. This solution is relatively cheap and effective, but is unacceptable for use with board-type systems. This is because the panels in a board-type overcladding system are not inert and are accordingly adversely affected by long-term contact with insulation material.

A number of different solutions have been proposed for board-type systems. For example, it is possible to incorporate solid horizontal fire-resistant shelves at regular intervals between the wall of the building and the cladding. This has the disadvantage of hindering cavity ventilation, and is expensive in terms of the extra construction material required for the shelves. It is possible to allow a degree of cavity ventilation without sacrificing too much fire-resistance by providing perforations in the shelves described above. This solution, however, is still relatively expensive in terms of the additional material required, since the shelves will generally be formed from stainless steel. Furthermore, the perforations in the shelves do not prevent the spread of fire behind the cavity as effectively as a solid shelf. It is known from German patent application DE 4036865 to address these problems through the provision of perforated metal shelves at periodic intervals between the cladding and the wall of the building, coupled with the use of heat-sensitive layers which release fire-resistant beads onto the perforated shelves in the event of a fire. This system provides adequate fire protection while still allowing for cavity ventilation through the perforated shelves in normal use. This system, however, is even more complex and costly to install than the simple shelf systems described above.

According to the present invention, there is provided a firebreak for a building overcladding system, which firebreak comprises a generally horizontal joint disposed between vertically adjacent cladding panels and a layer of mineral wool filling the space directly between the joint and the wall of the building when the joint is installed.

The mineral wool does not come directly into contact with the cladding panels, but is advantageously

attached to the horizontal joint. The joint is preferably made of metal, and consequently the potential problems caused by long term contact between mineral wool and cladding panels are avoided. The mineral wool, which is preferably high density compressed mineral wool, allows an adequate degree of cavity ventilation while still preventing the spread of fire in a vertical direction. Furthermore, mineral wool is comparatively cheap and easy to install.

While the firebreak of the present invention is particularly suitable for use in a board-type cladding system, it may also be utilised in rainscreen cassette systems.

In a preferred embodiment of the invention, the firebreak joint is attached to a framework upon which the cladding is supported. In addition, the joint is preferably provided with means enabling it to be attached to the cladding panels between which it is disposed, thereby providing extra support for the panels. In order to provide additional cavity ventilation, the joint need not abut the panels directly, but may be provided with spacing means which allow air and condensation to pass between the joint and the panels. To prevent ingress of wind-driven rain and to promote egress of condensation from within the cavity, an overhanging flange running along the length of the joint may be provided. This flange protrudes between the vertically adjacent panels, and prevents water ingress by overhanging the top edge of the lower panel, and facilitates drainage to the outside of the cladding of condensation formed on the inside face of the upper panel. Furthermore, by providing a convoluted air-flow path between adjacent panels, the flanged joint of this embodiment provides increased cavity ventilation without a corresponding increase in the risk of fire propagation.

For a better understanding of the present invention, and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawing, in which there is shown a side elevation of a firebreak in accordance with one embodiment of the invention.

In the drawing, a generally horizontal joint 1 is provided with a compressed high density mineral wool fire barrier 2. The mineral wool fire barrier 2 extends between the wall 3 of the building being clad and the joint 1. Additional mineral wool insulation 4 is applied to the wall 3, but this insulation does not extend to the cladding. The joint 1 is attached by rivets 5, 5' to a support framework 6, and between a vertically adjacent pair of panels 7 and 7'. The rivets 5, 5' are adapted to ensure that the panels 7, 7' are spaced from the joint 1 to provide ventilation gaps 8, 8'. The joint 1 is provided with an overhanging flange 9, which allows condensation on the inner surface of the upper panel 7 to escape, and reduces the ingress of wind-driven rain through the ventilation gap 8' between the lower panel 7' and the joint 1. The convoluted configuration of the path between the ventilation gaps 8 and 8' allows cavity ventilation without providing an easy path for the propagation of a fire. In order to reduce the possibility of sideways fire propagation, as well as to provide additional insulation, the spaces between the panels 7 and 7' and the vertical components of the support framework 6 are sealed with gasket tape 10.

CLAIMS:

1. A firebreak for a building overcladding system, which firebreak comprises a generally horizontal joint disposed between vertically adjacent cladding panels and a layer of mineral wool filling the space directly between the joint and the wall of the building when the joint is installed.

2. A firebreak as claimed in claim 1, wherein the mineral wool is attached to the joint.

3. A firebreak as claimed in claim 1 or 2, wherein the mineral wool is arranged so as not directly to contact the cladding panels.

4. A firebreak as claimed in claim 1, 2 or 3, wherein the joint is attached to a framework upon which the cladding panels are supported.

5. A firebreak as claimed in any one of the preceding claims, wherein the joint is provided with means for attachment to the cladding panels between which, when installed, the joint is disposed.

6. A firebreak as claimed in claim 5, wherein the attachment means include spacing means which allow air and condensation to pass between the joint and the cladding panels.

7. A firebreak as claimed in any one of the preceding claims, wherein the joint is provided with a longitudinally-extending flange which, when the firebreak is installed, protrudes between the vertically adjacent cladding panels.

8. A firebreak as claimed in claim 7, wherein the flange is shaped so as define a convoluted air-flow path between the vertically adjacent cladding panels.

9. A firebreak as claimed in any one of the preceding claims, wherein the mineral wool is high density compressed mineral wool.

10. A firebreak as claimed in any one of the

preceding claims, wherein the joint is made of metal.

11. A firebreak according to claim 1, substantially as hereinbefore described with reference to or as shown in the accompanying drawing.

The Patent Office

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Claims searched: 1-11

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Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): E1D: DF105, DF113

Int Cl (Ed.6): E04B

Other: ON - LINE: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
	NONE	